

## CLAIMS

1. A material-conveying apparatus for separating tramp iron from the material conveyed, comprising:

- 5        • a duct shell made of non-magnetic material and defining a duct;
- a porous membrane mounted across the inside of the duct in a plane substantially parallel to the general flow of conveyed material and dividing the duct into a material side and an air-supply side;
- an air-supply connection secured with respect to the duct shell to increase pressure in the air-supply side such that air flowing from the air-supply side to the material side through the porous membrane assists movement of conveyed material through the duct;
- a magnet mounted on the outside of the duct shell; and
- a steel pole piece protruding from the magnet through the duct shell into the duct,

whereby the pole piece modifies the magnetic field such that an effective field substantially fills a cross-section of the duct at the pole piece.

2. The material-conveying apparatus of claim 1 wherein the magnet is an electromagnet.

3. The material-conveying apparatus of claim 1 wherein the duct shell is of stainless steel.

25        4. The material-conveying apparatus of claim 1 wherein the pole piece includes a tapered leading edge, whereby conveyed material does not hang up on the pole piece.

5. The material-conveying apparatus of claim 1 wherein the duct shell has a substantially rectangular cross-section.

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6. A material-conveying apparatus for separating tramp iron from the material conveyed, comprising:

- a duct shell made of non-magnetic material and defining a duct;
- a magnet mounted on the outside of the duct shell; and
- a steel pole piece protruding from the magnet through the duct shell into the duct,

5 whereby the pole piece modifies the magnetic field such that an effective field substantially fills a cross-section of the duct at the pole piece.

10 7. The material-conveying apparatus of claim 6 wherein the magnet is an electromagnet.

8. The material-conveying apparatus of claim 6 wherein the duct shell is of stainless steel.

15 9. The material-conveying apparatus of claim 6 wherein the pole piece includes a tapered leading edge, whereby conveyed material does not hang up on the pole piece.

20 10. The material-conveying apparatus of claim 6 wherein the duct shell has a substantially rectangular cross-section.